

Assignment 2: Census GIS

- **Due date:** Sunday, April 5th 2020, 11:59PM, via LMS
- **Submission:** upload a single PDF report per person, with a filename as STUDENTNUMBER_A1.PDF, in A4 format. Maximum report length of 1500 words (excluding cover page, references, appendices, and any diagrams or images).
- **Assessment:** This individual assignment is worth **10 marks** in total. Assessment points are:
 - **Presentation:** Formally well-presented report of adequate length, with argument/results appropriately supported with well-presented maps, graphs and/or tables, referenced in text. (1 mark)
 - **Approach:** Adequacy and technical soundness of the documented approach (choice of tools, parameters etc). (2 marks)
 - **Data analysis:** Data analysis supported by appropriate data visualizations (maps, graphs). In particular, the choice of symbology and colours used in your maps should follow the guidelines for good maps design and legibility (3 marks)
 - **Interpretation and reflection:** quality of critical analysis, further discussion and recommendations evident in discussion section. Reflection on the theoretical learning objective. (3 marks)
 - **Referencing:** non-trivial motivations, methodological choices and interpretations should be supported by literature that is well and correctly referenced. Beware of plagiarism! (1 mark)
- **Prepare your report neatly.** Grading is based on completeness, accuracy and the professional quality of your submission.

Learning objectives

This exercise introduces the power and range of the GIS when dealing with spatial and attribute data. The exercise requires you to explore and find answers to problems using statistics/calculations to manipulate both spatial and attribute information. The learning objectives are:

- To acquaint yourself with the functions of a Desktop GIS (ESRI ArcGIS Pro) to manipulate vector data.
- You will understand how you can manipulate vector spatial data to isolate data of interest by space and attribute filters.
- You are able to translate simple analytical questions and translate them into simple attribute or spatial data queries.
- You are able to produce effective map visualizations supporting your analytical results.
- **Theoretical learning objective:** You will reflect on the influence of scale of representation, data accuracy, and data categorisation on the results you have produced.

Outcomes of this assessment

Your submission will consist of a written report. An ideal report would contain the following components:

- **Cover page:** with report title, subject title, assignment number, completion date, author name and student number, total number of pages and word count.

- **Introduction:** where you set the motivation, problem statement, and a brief summary of approach and main findings.
- **Methodology:** concise outline of the steps taken to address the problem and derive the results, with clear argument about the choice of tools and parameters used (possibly organised into tables).
- **Results:** (maps, graphs and tables to be included here)
- **Discussion:** a brief interpretation of the results presented above.
- **Conclusion:** Summary of findings, limitations of the study and possible extensions.
- **References:** with a consistent citation style, referencing the main literature that supported your approach, tool choice and/or parameter choices (and **Appendices** where applicable).

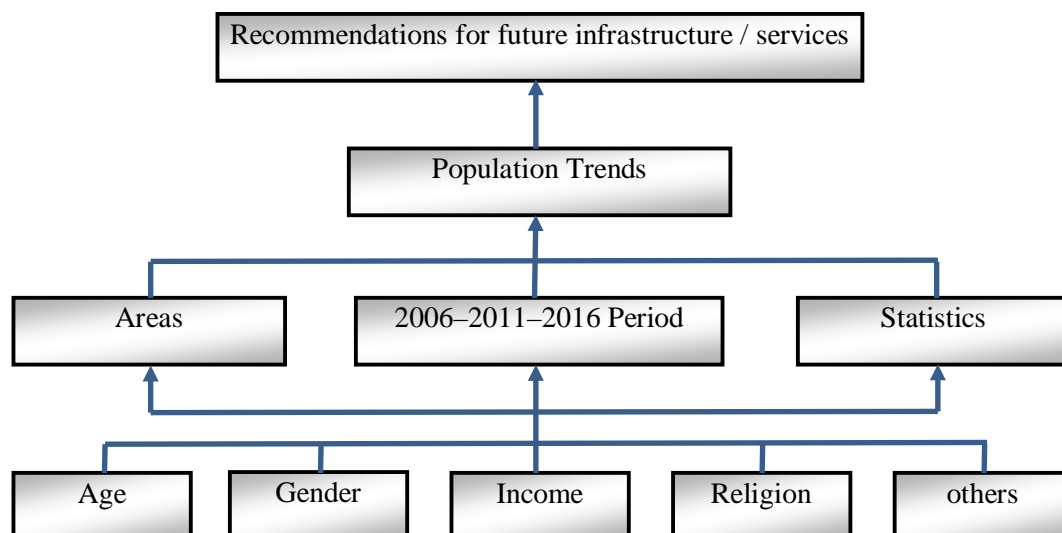
Task Overview

Document a trend in the demographic data capturing distinct characteristics about population residing in Statistical Level 2 Areas (SA2). Give planning recommendations based on the documented trend (supported by map visualisations) to the decision makers in the targeted local areas on services and/or infrastructure.

The Department of Planning, Transport, and Local Infrastructure requires detailed analysis of the population in certain areas. They provide access to the Australian Bureau of Statistics (ABS) Census Data spanning a 10 year period (2006, 2011, and 2016 Census). You will chose **one** area to analyse, **in the context of the whole (or part of) the city of Melbourne**. Analyse the Population Growth trend over this time period and give recommendations to local governments on infrastructure or services, or both, based on the population trend that you look at.

An example objective used in this exercise as follows –

“Provide recommendations to the Statistical Level 2 Areas (SA2) of Forest Hill, Mitcham, and Nunawading for future infrastructure projects that are necessary to respond to the changes in population and number of residents aged under 20 years.”



1. You only need to pick 1 population trend – look for ones that may be interesting (large changes). Some examples you can use or feel free to create your own:
 - a. Eg. Total population for SA2. (suggest many different changes)
 - b. Eg. Population people under 20 (suggest more parks, play grounds)
 - c. Eg. Number of people attending type of education, primary school, uni, tafe etc. (suggest high school, if there are lots of people in primary school)
 - d. Eg. number people with certain type of education (suggest type of work places, factories, offices).
 - e. Eg. The birth rate (maybe suggest kindergartens)
2. Choose **three** SA2 regions:
 - a. Justify your choice of area in your report. For example, you can choose all three SA2s from regional areas as you want to compare against different regional places, or mix it up and choose between regional and metro areas for comparison. Or choose three bordering SAs to see if they are similar, one SA2 may rely on bordering SA2 for services etc.. Or choose between inner metro and outer metro SAs for a comparison.
 - b. To understand more about SA2, read up on **Statistical Area Level 2 - Fact Sheet .pdf** and **Changes to Geographic Areas between Censuses.pdf** for how geographic areas evolved between Censuses. Both files are included within the Datapacks.zip in LMS.
3. Choose whichever fields you require from the CSV documents, make sure to include the data over the 3 census periods.
4. Do your analysis in ArcGIS Pro, do you want to display just the raw population data or make a percentage or average?
5. Make a choropleth map(s) for each of the census years, 2006, 2011 and 2016 showing your trend. The following link provides some very useful ideas – http://wiki.gis.com/wiki/index.php/Choropleth_map
6. Make your maps. Make sure your maps include these essential map elements – BOLTS: Border, Orientation, Legend, Title, and Scale.
7. Evaluate and suggest recommendations based on your trend and current infrastructure. You can evaluate how the trend varies by independent variables (eg. age) and in context (eg. compare with surrounding regions, metropolitan or country etc.).

If you cannot find spatial infrastructure data for your trend in the data given or online, make sure to find some information eg. a spreadsheet, government report, government plans and talk about it in your report.

www.data.vic.gov.au , www.aurin.org.au , www.services.land.vic.gov.au/SpatialDatamart/